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Studies of the importance of Cytomegalovirus infection in breast cancer

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Recently, Human cytomegalovirus (HCMV) infection has been found in breast cancer. Our research group has recently detected HCMV in most neoplastic cells in sentinel lymph nodes and brain metastases (BMs) of breast metastases of breast cancer. The exact mechanism by which BMs develop is unknown. Several risk factors are associated with BMs. These include human epidermal growth factor receptor 2–positive breast cancer, triple-negative breast cancer and COX-2 expression, as well as enhanced expression of integrin αvβ3, CXCR4/SDF-1 and CD44. COX-2 expression is thought to mediate impaired blood-brain barrier functions, while CXCR4/SDF-1, CD44, and integrin αvβ3 are thought to mediate increased metastatic potential to the brain and promote angiogenesis, which may contribute to the development of BM. HCMV infection induces CD40 on the surface of the infected cells that interact with CD40L and results in VEGF production. Moreover, increased expression of integrin αvβ3, CXCR4/SDF-1, and CD44 may promote angiogenesis and initiate metastasis formation. High expression of HCMV-US27, another putative chemokine receptor, has been associated with enhanced expression of CXCR4 and induces cellular migration. In addition, HCMV infection increase expression of CD44, which increases cell–cell interactions, cell adhesion, and migration of infected cells. The prevalence of HCMV proteins and nucleic acids is very high in primary and metastatic tumors and may drive the development of metastasis; therefore, this virus may represent a potential therapeutic target in metastatic cancer. The long term goal of my study is to further understand the oncomodulatory role of HCMV in breast cancer and metastasization.

Biography

Afsar Rahbar completed her PhD in 2004 and did her Postdoctoral studies at Karolinska Institutet, Stockholm, Sweden. During this period, I studied occurrence and significance of cytomegalovirus infection in patients with Glioblastoma Multiforme. Results from these studies are published in leading international journals. Currently, she works as a senior researcher at the Karolinska Institute with research focus on the significance of cytomegalovirus in patients with breast cancer. She has published 45 papers in leading international journals and she is a member of steering board for the Foundation Cure Cancer.

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